C. Remarks

The claims are 3-5 and 7, with claim 3 being independent. Claim 3 has been amended to better define the claimed invention. Support for the amendment may be found in original claims 3, as well as in the specification at page 17, lines 5-7, and page 23, lines 19-26. No new matter has been added. Reconsideration of the present claims is expressly requested.

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being allegedly obvious from U.S. Patent Application Publication No. 2002/0061431 A1 (Koyama) in view of U.S. Patent Application Publication No. 2002/0001744 A1 (Tsusaka). Claim 5 stands rejected under 35 U.S.C. § 103(a) as being allegedly obvious from Koyama in view of Tsusaka and U.S. Patent No. 6,218,035 B1 (Fuglevand). Claims 4 and 7 stand rejected under 35 U.S.C. § 103(a) as being allegedly obvious from Koyama in view of Tsusaka and U.S. Patent No. 6,523,699 B2 (Akita). The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicants would like to briefly discuss some of the features of the presently claimed invention. That invention, in pertinent part, is related to a method for producing a membrane electrode assembly for a proton-exchange membrane fuel cell, which comprises a polymer electrolyte membrane and an electrode metal catalyst layer. At least a part of the polymer electrolyte membrane infiltrates into the electrode metal catalyst layer.

According to the presently claimed production method, the polymer electrolyte membrane is not merely bonded to the electrode metal catalyst layer. The

electrode metal catalyst layer is coated with a composition of a precursor of the polymer electrolyte membrane to form a precursor layer, where at least a part of the composition infiltrates into the electrode metal catalyst layer. The precursor layer is then irradiated with an active energy ray to simultaneously conduct formation of a polymer electrolyte membrane and bonding of the polymer electrolyte membrane with the electrode metal catalyst layer such that at least a part of the polymer electrolyte membrane infiltrates into the electrode metal catalyst layer. Producing the membrane electrode assembly in this manner improves the bonding between the polymer electrolyte membrane and the electrode catalyst layer and reduces internal resistance. It also leads to the formation of a three-dimensional three-phase interface to increase a reaction area. As a result, a high-output membrane electrode assembly is provided.

Koyama is directed to a solid polymer electrolyte. In this reference, an electrolyte solution containing the electrolyte membrane material is applied to the catalyst layer, and then the electrolyte membrane and the catalyst layer, which have already been formed, are hot-pressed together (paragraph [0061]). Accordingly, Koyama does not disclose simultaneously conducting formation of a polymer electrolyte membrane and bonding of the polymer electrolyte membrane with the electrode metal catalyst layer by a polymerization process as presently claimed. Furthermore, as recognized by the Examiner in the Office Action, Koyama does not disclose infiltration as presently claimed.

Tsusaka is directed to a membrane electrode assembly and solid polymer electrolyte fuel cells. Tsusaka teaches adding a reactive metalloxane monomer both to the catalyst layer and the electrolyte membrane, and thereafter bringing the catalyst layer and

the electrolyte membrane into contact with each other for bonding. Tsusaka, however, also does not disclose or suggest simultaneously conducting formation of a polymer electrolyte membrane and bonding of the polymer electrolyte membrane with the electrode metal catalyst layer by a polymerization process as presently claimed. The catalyst layer and the electrolyte membrane in Tsusaka are both solid when the metalloxane monomer is polymerized. Furthermore, since only the metalloxane monomer is present in both layers after polymerization, the electrolyte membrane per se does not infiltrate into the catalyst layer.

Neither Fuglevand nor Akita can cure the deficiencies of Koyama and Tsusaka. These references are not concerned with simultaneous formation of the polymer electrolyte membrane and its bonding with the electrode metal catalyst layer and infiltration, or the process of achieving it as claimed.

Accordingly, Applicants respectfully submit that the cited documents, whether considered separately or in any combination, do not disclose or suggest all of the presently claimed elements.

Wherefore, withdrawal of the outstanding rejections and passage of the application to issue are respectfully requested.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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